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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 10/767,075
Filing Date: January 30, 2004
Appellant(s): XU ET AL.

Ashok K. Mannava, Reg. Number 45,301
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed 01/12/2010 appealing from the Office action mailed 08/12/2009.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct. No amendment after final has been filed.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

6,937,569	Sarkar et al.	08/2005

Xu et al. Building Topology-Aware Overlays using Global Soft-State, Oct. 2002, pp. 1-10.

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claim Rejections - 35 USC § 101

1. 35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

2. Claims 1-20 are rejected under 35 U.S.C. 101 the claimed invention is directed to non-statutory subject matter.

3. Claim(s) 1-18 are rejected under 35 U.S.C. 101 as the claimed subject matter does not fall within one of the four statutory categories of invention. While the claims recite a series of steps or acts to be performed, a statutory "process" under 35 U.S.C. 101 must (1) be tied to particular machine, or (2) transform underlying subject matter (such as an article or material) to a different state or thing. See page 10 of In Re Bilski 88 USPQ2d 1385. The instant claims are neither positively tied to a particular machine that accomplishes the claimed method steps nor transform underlying subject matter, and therefore do not qualify as a statutory process. The method including steps of … is broad enough that the claim could be completely performed *mentally, verbally or without a machine nor is any transformation apparent*. For example, claim 1 recites three steps are feasibly performed mentally, such as determining a first distance and second distance, and determining the location for a node based on the two distances. A method

of determining *location information for a computer* does not necessarily require that the method is implemented by a computer, since the steps can still be done mentally for determining *location information for a computer* without a machine.

4. For claims 19-20, consider claim 19, the claim is related to a machine (a node). However, the means for carrying out steps in the claim body are understood and possibly be read as *software modules or software tools* for carrying out those steps, given that no explicit hardware embodiments of these modules can be found in the specifications. Therefore, the claims are directed to software tools or modules per se or non-statutory subject matter.

Claim Rejections - 35 USC § 112

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claims 1, 10, 11, 17, 19, 21, 25 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

7. Claim 1 recites “the *set of landmark nodes* are located in routing paths between the node and the global landmark nodes”. It is vague what set of landmark nodes applicant is referring to. Claims 19, 21, 25 are rejected for the same rationale.

8. Claims 10-11 recite “randomly selecting a predetermined number of nodes.” This can mean no selection at all, making the claims vague since a predetermined number of nodes can be zero and the method is tied to local nodes or global nodes only. The claim recites “selecting a predetermined number of nodes,” which does not necessarily require the predetermined number to be greater than zero. Correction is required.

9. For claim 17, some of the local landmark nodes can mean an unknown number of local landmark nodes (definition of “some" from Merriam-Webster dictionary) and possibly can be zero, or some unknown quantity and therefore making the claim vague.

Claim Rejections - 35 USC § 103

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

11. Claims 1-6, 8-11, 14, 19-27 and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sarkar et al. (US 6,937,569, hereafter Sarkar), in view of Xu et al. (Building Topology-Aware Overlays using Global Soft-State, hereafter Xu).

12. For claim 1, Sarkar discloses a method of determining location information for a node in a network, the method comprising:

determining first distances from the node to a set of global landmark nodes and determining location information for the node based on the first distances (fig. 3, col. 6 lines 1-37, find distance calculated based on metrics such as network round trip time from a node to landmark 170—global landmark);

determining second distances from the node to a set of local landmark nodes proximally located to the node (fig. 3, col. 6 lines 16-44, find distance from a node to landmark 160--local landmark closer to the node); wherein the set of local landmark nodes are different than the set of global landmark nodes (fig. 3, two different landmarks) and the set of landmark nodes are located in routing paths between the node and the global landmark nodes (fig. 3, landmark 1 on routing path from the node to landmark 2); and

Sarkar does not explicitly disclose determining location information for the node based on the first distance and the second distance.

However, Xu discloses determining proximity information for the node based on the first distance and the second distance (page 1, right col., last par.; p.2, left col., first to fourth bullet point, generate proximity information of a node based on measurements of distances in terms of round trip time (RTTs) to multiple landmark nodes).

It would have been obvious for one skilled in the art at the time of the invention to combine the teachings of Sarkar and Xu to identify location information of a node because proximity information of a node can be used to locate the node in a network both efficiently and accurately (Xu, abstract)

13. For claims 19, 25, the claims are rejected for the same rationale as in claim 1.

14. Claim 21 is rejected for the same rationale as in claim 1. Sarkar-Xu further discloses peer-to-peer network distance measurement (see, Sarkar, fig. 3, col. 6 lines 1-37, find network distance, Xu, abstract, peer-to-peer)

15. For claim 2, Sarkar-Xu further discloses determining location information comprises determining location information associated with a physical location of the node in the network based on the first distance and the second distance (Xu, section 5 par. 2, section 5.1 par. 3-5, physical location of a node shown by landmark number is generated).

16. For claim 3, Sarkar-Xu further discloses determining location information comprises generating a landmark vector including the first distance and the second distance (Xu, section 5 par. 3-4, landmark vector).

17. For claim 4, Sarkar-Xu further discloses transmitting the landmark vector to at least one other node in the network storing landmark vectors for a plurality of nodes in the network (Xu, section 5.1 par. 2; page 5, right col., last par., publishing and storing map of proximity information at nodes).

18. For claim 5, Sarkar-Xu further discloses hashing at least a portion of the landmark vector to identify a location in an overlay network for storing the landmark vector (Xu, p. 5, right col., par. 2, fig. 8, hashing landmark vector to a target region in overlay space), wherein the overlay network is a logical representation of the network (Xu, p. 5, right col., par. 2, overlay); and transmitting the landmark vector to a node at the identified location to store the landmark vector (Xu, fig. 8, node p').

19. For claim 6, Sarkar-Xu further discloses determining first distances from the node to the set of global landmark nodes comprises: transmitting a probe packet to each global landmark node; and measuring round-trip-time to each global landmark node using the transmitted probe packet (Xu, section 5.1, par. 3, latency to from a node to landmarks, section 4, par. 4 and 5, round trip time).

20. For claim 8, Sarkar-Xu further discloses determining second distances comprises: selecting a plurality of the local landmark nodes within a predetermined distance from the node; and determining distances to each of the plurality of local landmark nodes (Xu, 5.4 par. 4, localized landmarks are selected to measure distances).

21. For claim 9, Sarkar-Xu further discloses selecting a predetermined number of nodes in the network to be global landmark nodes and local landmark nodes based on the number of nodes in the network (Xu, p. 6 table 2, number of landmarks).

22. For claim 10, Sarkar-Xu further discloses selecting a predetermined number of nodes in the network to be global landmark nodes comprises randomly selecting a predetermined number of nodes in the network to be global landmark nodes (Xu, 5.1, par. 3).

23. For claim 11, Sarkar-Xu further discloses selecting a predetermined number of nodes in the network to be local landmark nodes comprises randomly selecting a predetermined number of nodes in the network to be local landmark nodes (Xu, 5.1, par. 3).

24. For claim 14, Sarkar-Xu further discloses determining the first distances comprises determining distances to all of the global landmark nodes in the network (Xu, 5.1, par. 3).

25. For claim 20, Sarkar-Xu further discloses means for identifying a location in an overlay network for storing the location information using the location information, wherein the overlay network is a logical representation of the network; and means for transmitting the location information to a node at the identified location to store the location information (Xu, section 5.1, par. 4 and 5, fig. 8, store location information of node p at region z of the overlay or map).

26. For claim 22, Sarkar-Xu further discloses the memory is operable to store location information for a plurality of nodes in the peer-to-peer network that are physically close to the computer system (Xu, 5.1, par. 4).

27. For claim 23, Sarkar-Xu further discloses the processor is operable to identify a location in an overlay network for storing the location information using the location information, wherein the overlay network is a logical representation of the peer-to-peer network (Xu, 5.1, par. 4, logical overlay).

28. For claim 24, Sarkar-Xu further discloses a network interface operable to connect the computer system to the peer-to-peer network, wherein the computer system is operable to transmit the location information to the identified location in the overlay network via the network interface (Xu, 5.1, par. 2, all nodes in a region have access to the map, network interface is inherently used to communicate between nodes)

29. For claim 26, Sarkar-Xu further discloses instructions performing: identifying a location in an overlay network to store the location information using the location information, wherein the overlay network is a logical representation of the network (Xu, fig. 8, overlay or map).

30. For claim 27, the claim is rejected for the same rationale as in claim 5.

31. For claim 31, Sarkar-Xu further discloses the local landmark nodes are located within a predetermined distance to the node (Xu, 5.1, par. 2, nodes in a logical region have same proximity to each other).

32. Claims 7, 12, 13, 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sarkar-Xu, in view of Madruga et al. (US 2001/0034793, hereafter Madruga).

33. For claim 7, the claim is rejected as in claim 6. Sarkar-Xu does not disclose determining second distances from the node to the set of local landmark nodes comprises receiving an acknowledge message from each local landmark node receiving the probe packet.

However, Madruga discloses the same ([0130], a router in a request path can be used as a landmark and sends back an ACK)

Sarka-Xu-Madruga further discloses:

determining the second distance to the at least one local landmark node in response to receiving the acknowledge message (Xu, section 5.1, par. 3, latency to from a node to landmarks, section 4, par. 4 and 5, round trip time or RTT of Xu can be used to calculate network distance upon receiving ACK)

It would have been obvious for one skilled in the art at the time of the invention to combine the teachings of Sarkar-Xu and Madruga to measure network distances to intermediate nodes and use them to estimate a node's location for better accuracy.

34. For claim 12, Sarkar-Xu does not disclose selecting a predetermined number of nodes in the network to be local landmark nodes comprises: identifying nodes located near at least one gateway router or including the at least one gateway router in the network; and selecting at least one of the identified nodes to be a local landmark node However, Madruga discloses using routers as a landmark in a peer-to-peer network ([0130]). It would have been obvious for one skilled in the art at the time of the invention to use a router as a local landmark to simplify network topology.

35. For claim 13, Sarkar-Xu-Madruga further discloses a number of global landmark nodes in the network is less than a number of local landmark nodes in the network (Madruga, [0130], each path to global landmark has many local landmarks (routers)).

36. For claim 17, Sarkar-Xu-Madruga further discloses the plurality of local landmark nodes includes a plurality of routers in the routing path between the node and the at least one global landmark node (Xu, section 6, par. 2, routers, Madruga, [0130], routers as landmarks).

(10) Response to Argument

<35 U.S.C 101 rejection>

Claims 1-14 and 17

Claims 1-14 and 17 recite steps are feasibly performed mentally, verbally or without a machine such as determining first distances and second distances, and determining the location for a node based on the two distances. Determining distances can be done by a person on paper (with the nodes and landmarks drawn out on paper)

or mentally without a machine. Determining location information for a computer can still be done mentally for determining (to see which landmark is closer to the node based on the distances). The process also does not transform underlying subject matter (such as an article or material) to a different state or thing.

The claims are therefore rejected under 35 U.S.C. 101 as the claimed subject matter does not fall within one of the four statutory categories of invention. While the claims recite a series of steps or acts to be performed, a statutory "process" under 35 U.S.C. 101 must (1) be tied to particular machine, or (2) transform underlying subject matter (such as an article or material) to a different state or thing. See page 10 of In Re Bilski 88 USPQ2d 1385.

Claims 19-20

For claims 19-20, consider claim 19, the claim is related to a machine (a node). However, the means for carrying out steps in the claim body are understood and possibly be read as *software modules or software tools* for carrying out those steps, given that no explicit hardware embodiments of these modules can be found in the specifications. Therefore, the claims are directed to software tools or modules per se or non-statutory subject matter.

Applicant argues that the preamble of the claim recites "a node" defined in the specification as a computer, therefore the claims are statutory. The examiner respectfully disagrees. First, limitations in the preamble are not given weight. Second,

"the node comprising" is open-ended. Therefore, even if a node is hardware in the specification, the body of the claim may still only include software embodiments.

<35 U.S.C 112 rejection>

The examiner submits to maintain the rejection.

Claims 1, 10, 11, 17, 19, 21, 25 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1 recites "the *set of landmark nodes* are located in routing paths between the node and the global landmark nodes". It is vague what set of landmark nodes applicant is referring to. Applicant argues that they meant to recite "a set of local landmark nodes." However, the word "local" is clearly omitted from the claims, making the claims vague as to which set of landmark nodes or even some other landmarks nodes besides the local and global landmark nodes is referred to. If one read the set of landmark nodes as the set of global landmark nodes, the limitation is inherent and can be given no weight in examination. Claims 19, 21, 25 are rejected for the same rationale.

Claims 10-11 recite "randomly selecting a predetermined number of nodes." This can mean no selection at all, making the claims vague since a predetermined number of nodes can be zero and the method is tied to local nodes or global nodes only. The claim recites "selecting a predetermined number of nodes," which does not necessarily

require the predetermined number to be greater than zero. This rejection is maintained since it's known in the art that one can select a selection of zero nodes.

For claim 17, some of the local landmark nodes can mean an unknown number of local landmark nodes (definition of "some" from Merriam-Webster dictionary) and possibly can be zero, or some unknown quantity and therefore making the claim vague. This rejection is maintained since some nodes can be any number of nodes and can be zero.

<35 U.S.C. 103 rejection>

Appellants argue that the prior art does not teach "the set of landmark nodes are located in routing paths between the node and the global landmark nodes".

The examiner respectfully disagrees.

First, there is no recitation of "the set of **local** landmark nodes are located in routing paths between the node and the global landmark nodes." Given broadest reasonable interpretation, the limitation is read as "the set of **global** landmark nodes are located in routing paths between the node and the global landmark nodes;" and is therefore inherently true in Sarkar (fig. 2, routes between node 60 and landmark 2 or global landmark go through landmark 2)

Second, even when the limitation is read *as meant by the appellants*, the prior art clearly teaches "the set of **local** landmark nodes are located in routing paths between the node and the global landmark nodes" (see Sarkar, fig. 2, landmark 1 (item 160) is in

at least one routing path from node 60 to landmark 2 (item 170), for example, path 60-160-190-140-170, path 60-160-190-120-170, path 6-160-110-180-170).

Third, that the set of local landmark nodes are in routing paths from the node to the set of the global landmark nodes does not add any patentable distinction to the process of determining location information of for the node, which is the core of the invention, nor does it add to how a landmark node is considered local or global. One skilled in the art can appreciate that even when a local landmark node is in a routing path between a node and a global landmark node, it is not always true that the distance (logical or physical) from the node to the local landmark node is shorter than to the global landmark node. Almost any node on a network can be considered an intermediate node or in a routing path from a first node to second node.

Appellant argues that the prior does not teach a set of landmark nodes.

One skilled in the art would appreciate that a set mathematically can have a range from zero to a positive natural number N of members. One normally writes “a set of nodes”, never “a set of node.” And that does not entail that a set has to have more than two members. Same rationale applies to distances. One would not write distance to a set of nodes, but normally write distances to a set of nodes.

In the specification, applicant recites the set can have one member (par. 1 on page 3). The broadness of the claims allows one to see that the claims cover the case of one distance to a set of one landmark node.

Therefore, the examiner submits to that the prior art does teach distances to a set of landmark nodes (Sarkar, fig. 3, col. 6 lines 1-37, find distance calculated based on metrics such as network round trip time from a node to landmark 170—global landmark).

Also, Xu discloses determining proximity information for the node based on the first distances and the second distances (page 1, right col., last par.; p.2, left col., first to fourth bullet point, generate proximity information of a node based on measurements of distances in terms of round trip time (RTTs) to multiple landmark nodes).

Applicant argues that the prior art does not teach "determining location information for the node based on the first distances and the second distances"

It is maintained that the prior art does teach the limitation. Xu discloses determining proximity information for the node based on the first distances and the second distances (page 1, right col., last par.; p.2, left col., first to fourth bullet point, generate proximity information of a node based on measurements of distances in terms of round trip time (RTTs) to multiple landmark nodes). Given broadest reasonable interpretation of "location information" of a node, the location information can be read as proximity information (some information associated with location) of a node that Xu determines (section 4 on page 3, generating proximity information based on a plurality of round trip times or network distances from a node to a plurality of landmarks (can be read as local or global) to find the closest landmark). Also, given the broadness of the

limitation, it can mean comparing the distances and assign node location based on the location of the landmark that has shortest distance to the node, taught by Xu as above.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

/HH/

Hieu Hoang

Patent Examiner

Art Unit 2452

March 09, 2010

Conferees:

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